

REMARKS

The indicated allowance of claims 9-14 and indicated allowability of claims 4 and 6-8 are noted, with thanks. However, in view of the foregoing amendments and following comments, it is believed that all of the pending claims are allowable over the art.

In the Office Action mailed April 22, 2005, the Examiner rejected claims 1 to 3 and 5 under 35 USC 102(b) as being anticipated by Ernest et al. (USPN 4,827,348). This rejection is respectfully traversed.

The present invention as defined by method claim 1 and apparatus claim 5 is directed specifically to the resetting of an array of **active pixel sensors** in a novel manner in order to avoid the problem of latch-up caused by driving substantial amounts of charge at one time onto the array substrate. The array **reset cycle**, in accordance with the present invention, includes **two steps**. In the initial step, the **active pixel sensors** are divided into predetermined groups of one or more sensors and a pre-reset voltage is sequentially applied to the groups, resulting in a series of small charges to be driven onto the array substrate rather than a large charge. Once all of the **active pixel sensors** have been **pre-reset** in this manner, the **reset cycle is completed** by applying a predetermined voltage to all of the sensors substantially simultaneously thereby assuring that all of the **active pixel sensors** are **reset** to substantially the same level. However, once again, this latter step only results in a small charge to be driven onto the array substrate since the **active pixel sensors** are already **pre-set** to a level near the final level.

It is respectfully submitted that Ernest et al does not and cannot anticipate the method and apparatus for resetting an array of **active pixel sensors** as defined by claims 1 and 5 since Ernest et al describes an exposure control system for a dual mode camera that is constructed

from **charged couple devices** (CCD's), which are not and cannot be considered to be **active pixel sensors**.

Ernest et al is directed towards a method and apparatus for exposure control in an electronic camera that utilizes CCD's and that is capable of converting between two different and independent modes of operation, namely a video mode and a still mode. The Ernest et al camera includes the use of an electronic shutter operation in video mode, and the use of a mechanical shutter in still mode. In the background of the invention, Ernest et al discusses an electronic shutter technique for CCDs for a video readout that is known in the art , "In the video mode of operation the length of time during which each of a Field A and a Field B is integrated or exposed to image light is controlled electronically without a mechanical shutter mechanism by alternately integrating and discharging or reading out the respective two fields in synchronism with timing control supplied by a CCD Clock." Column 1, Lines 19 – 25. Subsequently, an electronic shutter can also be used in a still mode, as is further discussed, "Moreover, the same electronic shutter operation may be used when the camera is switched to a still mode of operation by clearing the CCD (again in synchronism with CCD Clock timing), integrating the CCD to the desired still image and terminating CCD exposure by readout. In this connection, it is to be noted that the still mode of operating employs a different method of CCD signal formation and read-out than the video mode but the exposure sequence for both is as depicted in Figure 1 of the drawings." Column 1, Lines 28 –37. In Figure 1, a prior art timing diagram of the differences between a video image capture and a still image capture is shown.

Ernest et al further teaches these two modes as separate modes that a CCD image sensor can be placed in. This is shown in Figure 1, where the "still" mode is activated by the "still

switch on" signal, which subsequently clears the CCD (or resets) by activating the "clear CCD" signal. Ernest et al does not teach the use of a pre-reset before the subsequent reset shown as the activation of the "clear CCD" signal, but merely shows the process of the two modes as an electronic shutter in order to illustrate the necessity of a mechanical shutter for still mode.

Ernest et al teaches the process of reset only for a **CCD sensor**, which is substantially different than a reset in an **Active Pixel Sensor (APS)**, as defined in present claims 1 and 5. CCDs are manufactured in a specialized process to allow the activation of a very large positive potential on the back-plane of the device in order to perform the reset, or "clear CCD" signal that Ernest et al describes. As a result, CCDs cannot be embedded with digital circuitry that could be included in a CMOS active pixel sensor, as the processes are not compatible.

In addition, Ernest et al does not refer to or address the problem of latch-up created by the rapid acquiring of charge in the substrate. This is not unexpected since this is not be a problem in a CCD based image sensor.

The Examiner is therefore respectfully requested to withdraw his rejection of claims 1 to 3 and 5 under 35 USC 102(b) as being anticipated by Ernest et al.

Having regard to the prior art made of record and not relied upon, Applicants respectfully submit that:

US Patent 5,585,814 – Ueno et al is directed towards an improved reset circuit for a photoelectric converting device that appears to be based on bipolar photosensitive elements. The main objective of this circuit is to perform a reset of the column lines in such a manner that current consumption is reduced from a conventional column reset. This patent does not teach the 2-step reset method including sequentially pre-resetting groups of pixels and then subsequently resetting all of the pixels in accordance with the present invention.

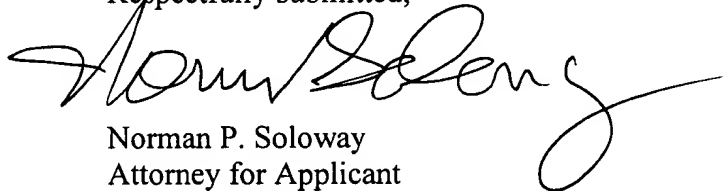
US Patent 5,262,871 – Wilder et al is directed towards a manner of reading out information from an array of pixel sensors in such a manner that resolution may be reduced. Multiple pixels are read out as data from a same pixel to create reduced resolution images that may be helpful in a reduced scan to identify areas of interest that are then subsequently rescanned at higher resolution in order to process the image data. This patent does not teach the 2-step reset method including sequentially pre-resetting groups of pixels and then subsequently resetting all of the pixels in accordance with the present invention.

Reconsideration of the application is respectfully requested.

Having dealt with all the objections raised by the Examiner, the Application is believed to be in order for allowance. Early and favorable action are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

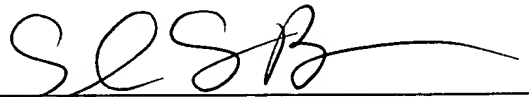
Respectfully submitted,



Norman P. Soloway
Attorney for Applicant
Reg. No. 24,315

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 10, 2005, at Tucson, Arizona.

By 

NPS:sb

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567